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Effect of surface roughness, stand-off distance and angle on YSZ SPS: from test piece to real components

Abstract:

The microstructure and performance of YSZ coatings deposited using Suspension Plasma Spray (SPS) has been extensively studied and reported in the past. Stand-off distance is generally included as a variable when considering a design of experiments, surface roughness has been acknowledged as a key contributing factor, and even studies on incident angle have been published before, although to a limited extent. However, complex geometries of engine components and existing limitations (such as clear line of sight access and existing coatings) require a holistic approach to ensure that new concepts can be successfully validated and quickly iterated for aerospace applications.

This talk will cover examples of SPS being introduced into the existing Rolls-Royce supply chain as well as more exploratory applications of the technique. In both cases, attention was paid to ensure that the testing, as well as the test pieces coated, were representative of the final application. This approach allows for a more realistic development as well as shorten introduction into service of new technologies.

Biography:

After graduating in Applied Physics at the Universidad Complutense of Madrid, I briefly worked as an IT Consultant for one of Spain biggest investing banks. Missing the thrill of science, I moved to Copenhagen, Denmark, to pursue a Master degree in Nanoscience, where I was first exposed to thermal spray. Following this new field, I moved to Nottingham, UK to do my Ph.D. working with SPS, SHVOF and high temperature coatings. Joining Rolls-Royce in 2022 as a Materials Engineer, I've since then worked on thermally sprayed coatings for sealing and environmental protection, as well as introducing SPS into the business